NOAA EXPERIMENTAL DIVING UNIT
REPORT 93-03

POTENTIAL APPLICATIONS of CLEAR-WATER BOXES for PHOTODOCUMENTATION of UNDERWATER STRUCTURES IN TURBID WATERS

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DIVING PROGRAM

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Clear-water boxes can be used to place clear water between a camera lens and a structure during photodocumentation operations in turbid waters. Clear, precise photos are necessary for obtaining accurate descriptions of underwater structures, monitoring structural integrity, determining the extent of damage and types of repairs needed to minimize costs, and maintaining records for future use.

The advantages of incorporating clear-water boxes with underwater camera systems are:

1. Photodocumentation can be accomplished in very low visibility waters (≈2").
2. Objects and structures can be centered correctly by positioning them in the middle of the front plate of the box.
3. Camera settings can be predetermined and preset on the surface conserving in-water time for accomplishing the assigned tasks.
4. Time and costs savings can be realized by producing clear underwater photographs independent of underwater visibility. The visibility in most ports is normally very low, yet the "in port" period is normally the most desirable time for underwater photodocumentation and maintenance.

Clear-water boxes and underwater camera systems have proven to be extremely beneficial to engineers when they are determining underwater hull conditions. Engineers see first hand the extent of marine fouling, the condition of paint coat systems, and the condition of all underwater hull appendages. This, in turn, provides them with the necessary information required to properly prepare individualized bid packages for maintenance during drydocking. Unanticipated repairs and maintenance can be

significantly reduced. The system can also be used to document the effectiveness of underwater hull cleaning procedures.

Sample photos taken with the clear-water box are included to demonstrate the clarity which can be produced in limited visibility conditions. The photographs were taken at the U.S. Coast Guard Base, Portsmouth, VA., less than 3 miles from NOAA Atlantic Marine Center, Norfolk, VA. Also included are the locations, dates, and water visibility when the photos were taken.

This clear-water box system has the potential to be used with still photography, underwater videos, and related areas where turbid waters present difficulties in obtaining clear underwater photodocumentation.

SCHEMATIC OF SIDE VIEW OF CLEAR-WATER BOX AND CAMERA SYSTEM

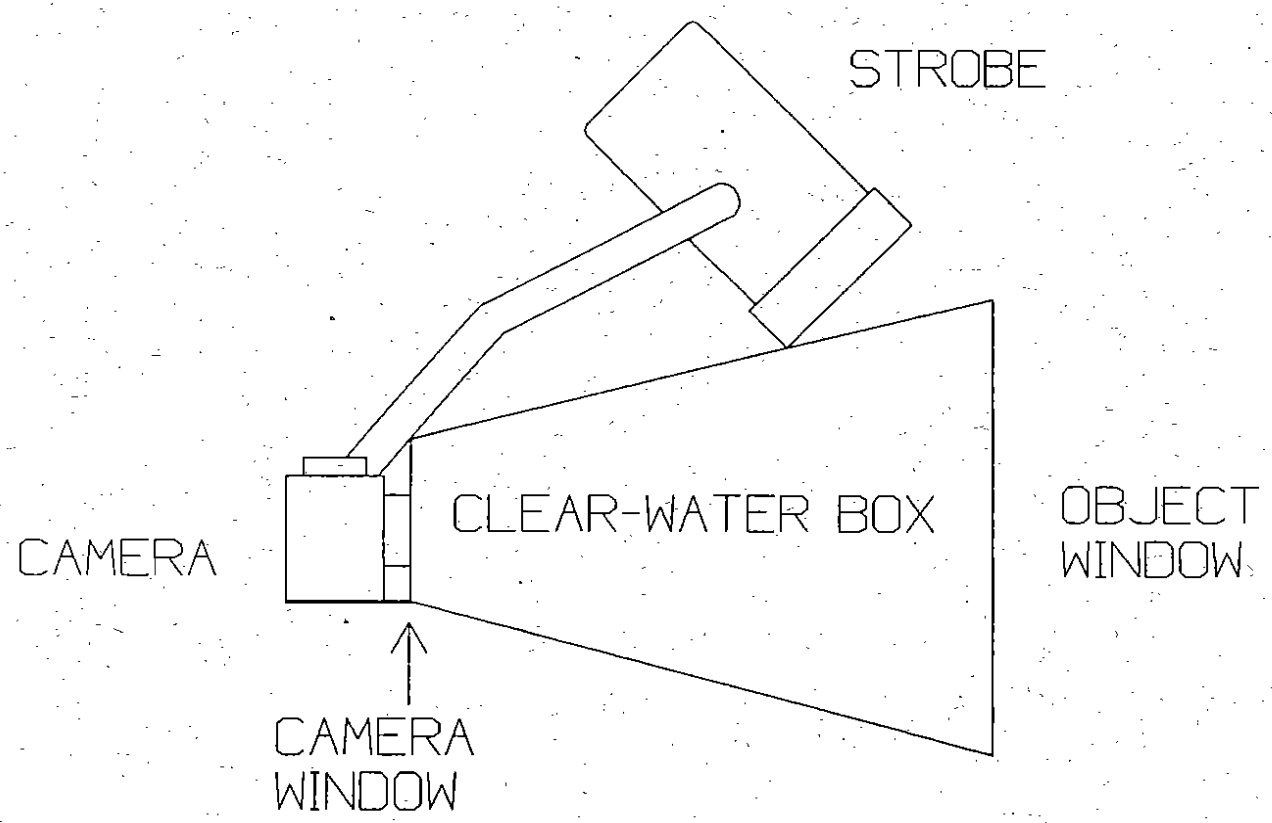


Figure 1

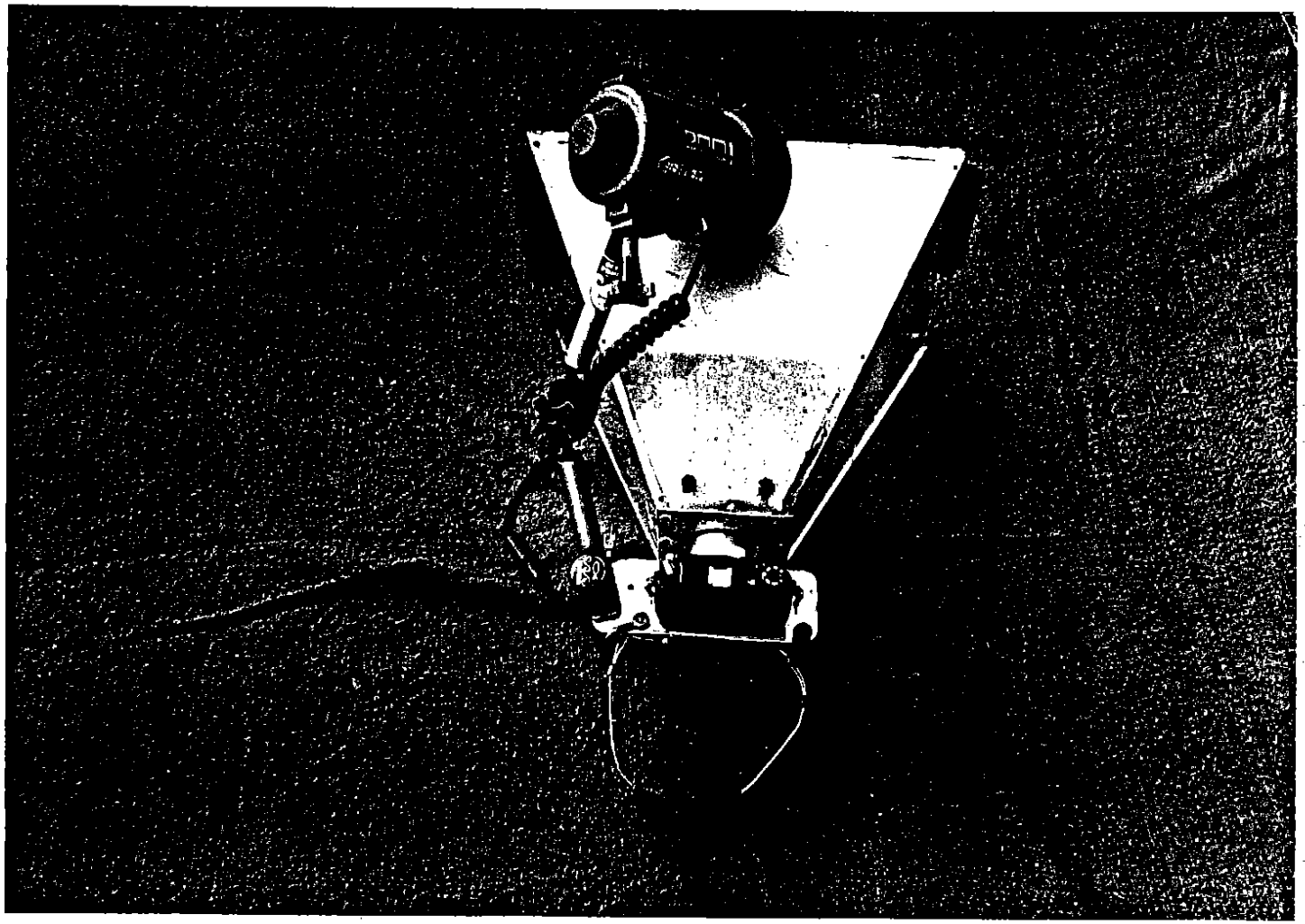


Figure 2

Top View of Clear-Water Box and Camera System

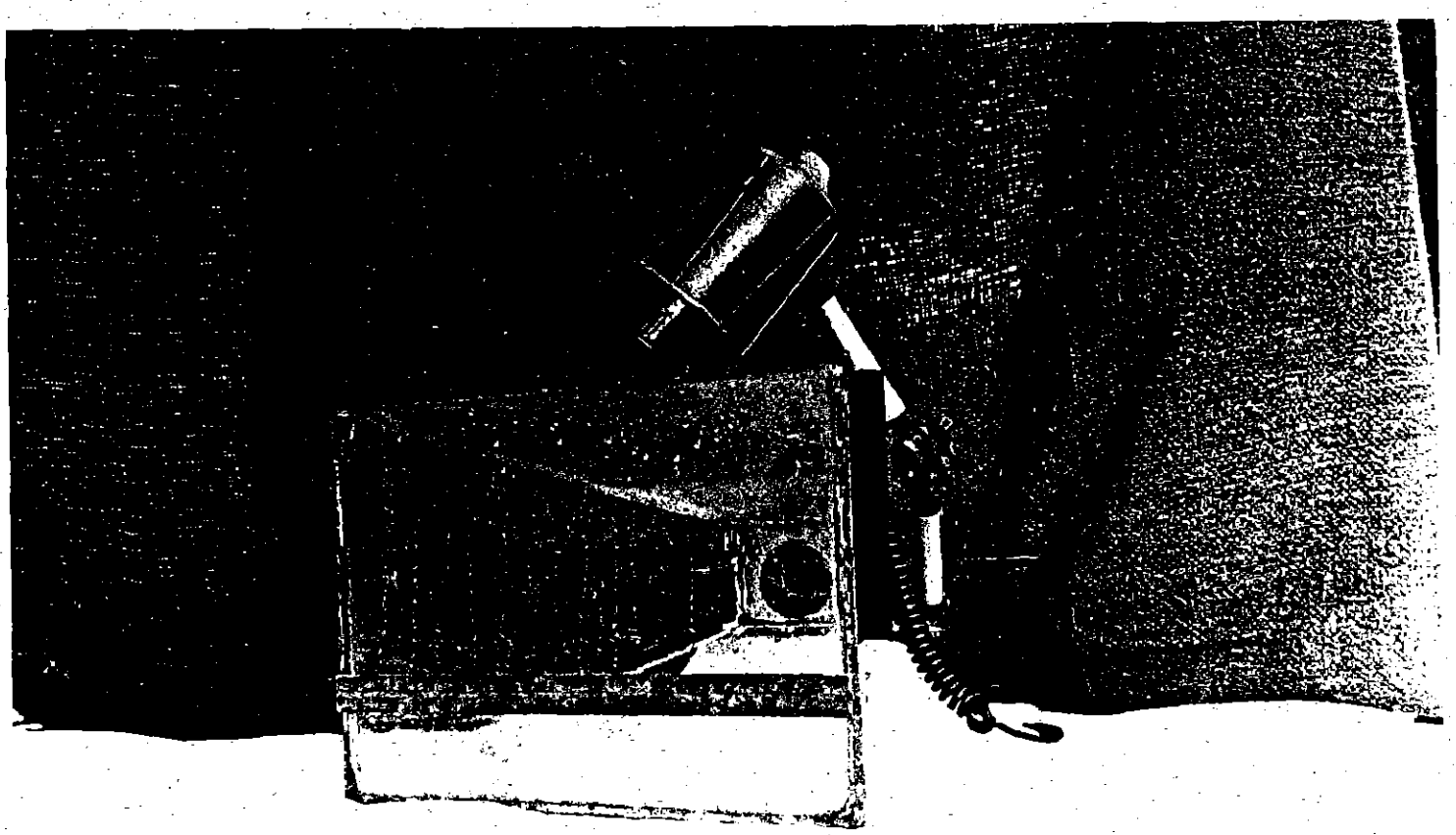
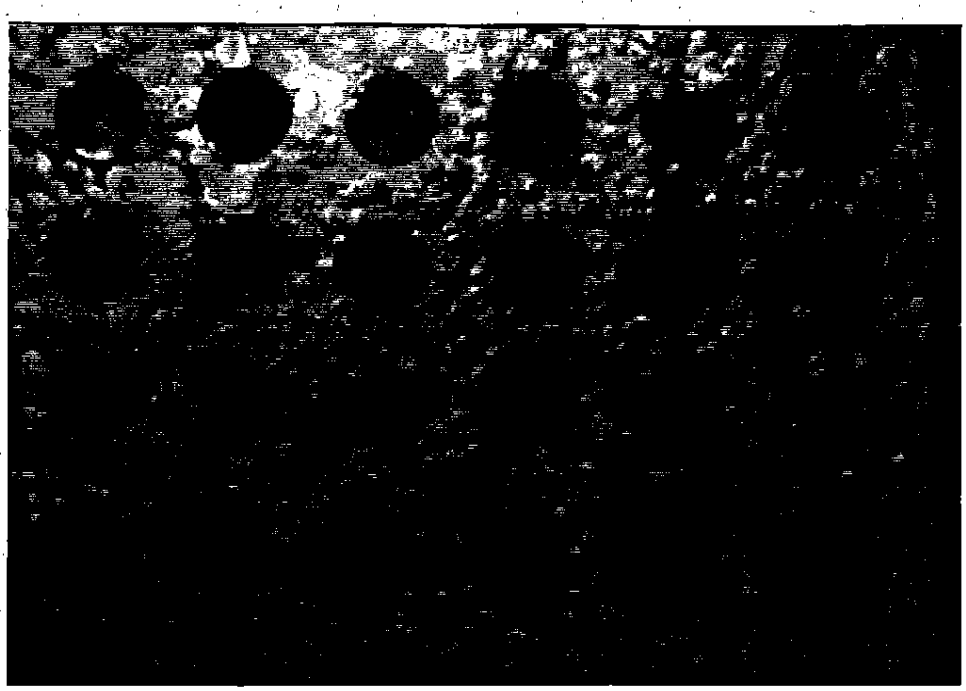
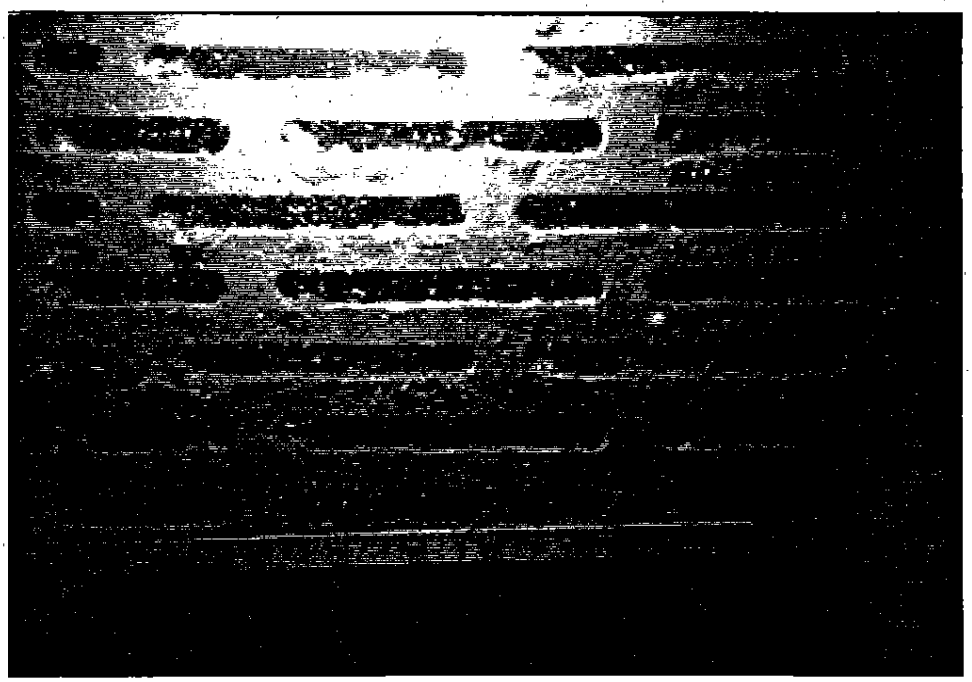


Figure 3

Front View of Clear-Water Box and Camera System



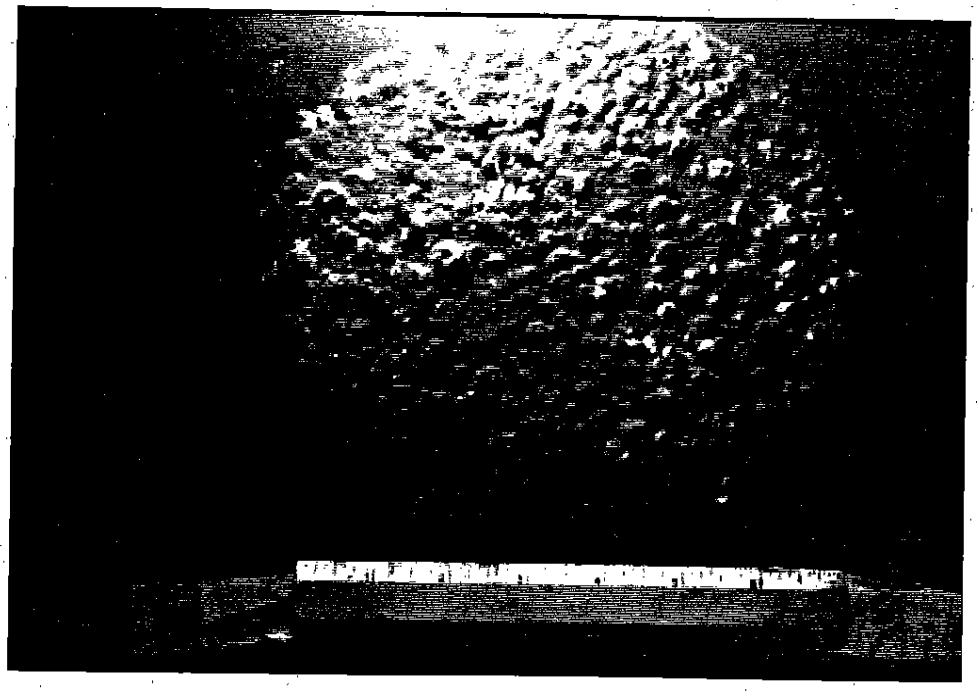
U.S. Coast Guard Cutter Pt. Arena - Intake Grating
April 19, 1990
Portsmouth, VA
Visibility - 1 ft.

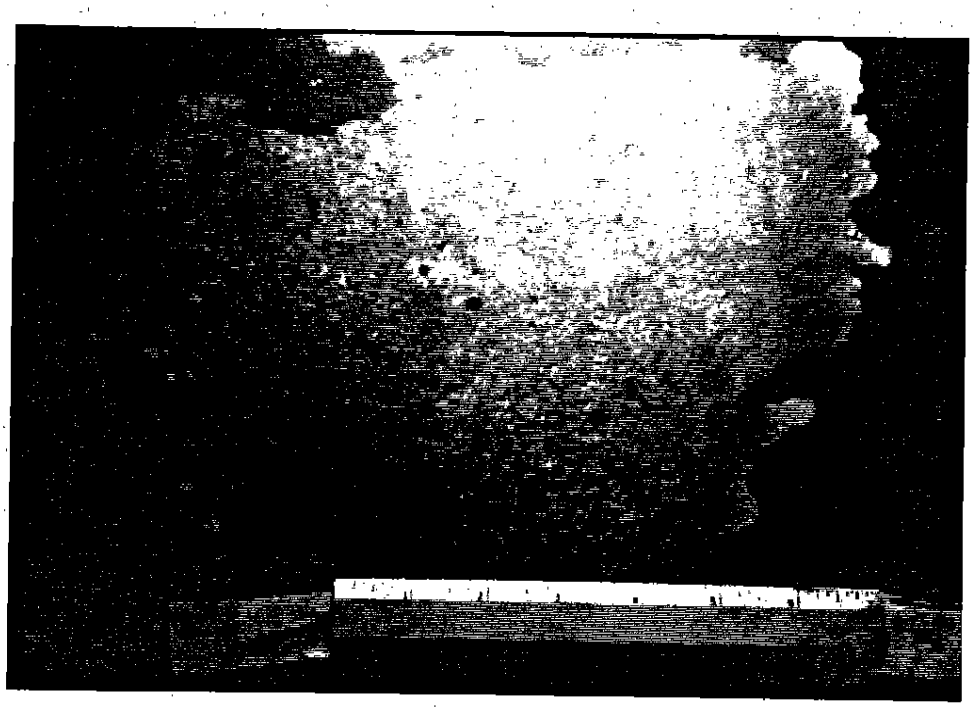


U.S. Coast Guard Cutter Northland - Intake Grating
20 Sept. 1991
Portsmouth, VA
Visibility - .5 ft

Photos by Linda Moroz

Figure 4





U.S. Coast Guard Cutter Aquidneck
Top - Reference Cell Bottom - Paint Coat Damage
12 Sept. 1990
Portsmouth, VA
Visibility - 1.5 ft

Photos by Linda Moroz

Figure 5